C L A I M S

1. A process for the electrophoretic analysis of DNA fragments produced in DNA sequencing operations which comprises providing tagged DNA fragments having at least one chromophore or fluorophore produced by the sequencing chemistry, and detecting said fragments as they are resolved by electrophoresis through a gel.

2. The method of DNA sequencing by the chain termination method according to claim 1 wherein a primer oligonucleotide labeled with a colored tag is used.

3. The method of DNA sequencing by the chain termination method according to claim 1 wherein a primer oligonucleotide labeled with a fluorescent tag is used.

4. The method of DNA sequencing by the chemical degradation method according to claim 1 wherein DNA molecules labeled with a colored tag are used.

5. The method of DNA sequencing by the chemical degradation method according to claim 1 wherein DNA molecules labeled with a fluorescent tag are used.

6. The method of DNA sequencing according to claim 1 wherein a set of four chromophores or fluorophores are used to tag said DNA fragments produced by the sequencing chemistry.

7. In the method of DNA sequencing by the chain termination method;

the improvement wherein the primer oligonucleotide used in each of the four sequencing reactions, A, C, G and T, has a different colored tag attached to it, and wherein aliquots

of the aforesaid sequencing reactions are combined and electrophoresed together on polyacrylamide gel and detected after their separation on the gel.

8. In the method of DNA sequencing by the chain termination method;

the improvement wherein the primer oligonucleotide used in each of the four sequencing reactions, A, C, G and T, has a different fluorescent tag attached to it, and wherein aliquots of the aforesaid sequencing reactions are combined and electrophoresed together on polyacrylamide gel and detected after their separation on the gel.

9. In the method of DNA sequencing by the chemical degradation method;

the improvement wherein the DNA molecules are labeled with different colored tags, and a different colored DNA is used in each of the chemical modification reactions, and aliquots of the aforesaid sequencing reactions are combined and electrophoresed together on a polyacrylamide gel and detected after their separation of the gel.

10. In the method of DNA sequencing by chemical degradation method;

the improvement wherein the DNA molecules are labeled with different fluorescent tags, and a different fluorescent DNA is used in each of the chemical modification reactions, and aliquots of the aforesaid sequencing reactions are combined and electrophoresed together on a polyacrylamide gel and detected after their separation of the gel.

11. In the method of DNA sequencing by chemical degradation method;

the improvement wherein the DNA molecules are provided with an amino group, which is coupled to a dye molecule subsequent to the sequencing reactions.

12. In the method of DNA sequencing by the chemical degradation method;

the improvement wherein the DNA molecules are provided with a protected amino group, which is deblocked and coupled to a dye molecule subsequent to the sequencing reactions.

13. In the method of claim 11, the further improvement wherein the products of each of the different sequencing reactions are coupled with a different color dye, aliquots of the dye labeled reaction are combined and electrophoresed on a polyacrylamide gel and detected after their separation on the gel.

14. In the method of claim 12, the further improvement wherein the products of each of the different sequencing reactions are coupled with a different color dye, aliquots of the dye labeled reaction are combined and electrophoresed on a polyacrylamide gel and detected after their separation on the gel.

15. In the process for the electrophoretic analysis of DNA fragment sets produced in DNA sequencing operations wherein a set of four fluorophores are used to tag the DNA fragments produced by the sequencing chemistry and permit the detection and characterization of the fragments as they are resolved by electrophoresis through a gel, the improvement wherein the four different fragment sets are tagged with the fluorophores fluorescein, Texas Red, tetramethyl rhodamine, and 7-nitro-benzofurazan.

16. The method of claim 15 wherein the DNA sequencing is carried out by the chain termination method.

17. In the method of claim 15 where the DNA sequencing is carried out by the chemical degradation method comprising modification and cleavage reactions.

18. In the method of claim 17 wherein the DNA fragments are labeled with dye prior to the modification reactions.

19. In the method of claim 17 wherein the DNA fragments are labeled with dye subsequent to the modification reactions but prior to the cleavage reactions.

20. In the method of claim 17 wherein the DNA fragments are labeled with dye subsequent to the cleavage reactions.

21. In the method of DNA sequencing by the chain termination method comprising four sequencing reactions;

the improvement wherein the primer oligonucleotides used in the sequencing reactions, A, C, G and T,has a different fluorescent tag attached to it, and wherein aliquots of the aforesaid sequencing reactions are combined and electrophoresed together on a polyacrylamide gel and detected after their separation on the gel, said fluorescent tags being fluorescein, Texas Red, tetramethyl rhodamine, and 7-nitro-benzofurazan.

22. In the method of DNA sequencing by the chemical degradation method comprising modification and cleavage reactions;

the improvement wherein the DNA molecules are labeled with different fluorescent tags, and a different fluorescent DNA is used in each of the chemical modification reactions, and aliquots of the aforesaid sequencing reactions are combined and electrophoresed together on a polyacrylamide gel

and detected after their separation of the gel, said fluorescent tags being fluorescein, Texas Red, tetramethyl rhodamine, and 7-nitro-benzofurazan.

23. A novel system for the electrophoretic analysis of DNA fragments produced in DNA sequencing operations comprising:

a source of chromophore or fluorescent tagged DNA fragments from sequencing operations,

a zone for containing an electrophoresis gel,

means for introducing said tagged DNA fragments to said zone; and

photometric means for monitoring said tagged DNA fragments as they move through said gel.

24. The novel system of claim 23 wherein the photometric means is an absorption photometer.

25. The novel system of claim 23 wherein the photometric means is an fluorescent photometer.

26. The novel system of claim 23 wherein the DNA fragments are labeled with an amino group which is coupled to a dye molecule.

27. The novel system of claim 23 wherein a set of four chromophores or fluorophores are present to tag said DNA fragments from sequencing operations.

28. A novel system for the electrophoretic analysis of DNA fragments produced in DNA sequencing operations comprising:

a source of chromophore or fluorescent tagged DNA fragments from sequencing operations;

a zone containing an electrophoresis gel;

means for introducing said tagged DNA fragments to said zone; and

photometric means for monitoring said tagged DNA fragments as they move through said gel.

29. The novel system of claim 28 wherein said source of tagged DNA fragments from sequencing operations is positioned at one end of said zone, and said detector is positioned in proximity to the opposite end of said zone.

30. The novel system of claim 28 wherein a set of four chromophores or fluorophores are present to tag said DNA fragments from sequencing operations.

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